CLAIMS

1. A thin film capacitance element composition, wherein:

a bismuth layer compound having a c-axis oriented vertically with respect to a substrate surface is expressed by a composition formula of $(Bi_2O_2)^{2+}$ $(A_{m-1}$ B_m $O_{3m+1})^{2-}$ or Bi_2A_{m-1} B_m O_{3m+3}, wherein "m" is an even number, "A" is at least one element selected from Na, K, Pb, Ba, Sr, Ca and Bi, and "B" is at least one element selected from Fe, Co, Cr, Ga, Ti, Nb, Ta, Sb, V, Mo and W; and

Bi in said bismuth layer compound is excessively included with respect to said composition formula of $(Bi_2O_2)^{2+}$ $(A_{m-1}$ B_m $O_{3m+1})^{2-}$ or Bi_2A_{m-1} B_m O_{3m+3}, and the excessive content of Bi is in a range of $0 < Bi < 0.5 \times m$ mol in terms of Bi.

2. The thin film capacitance element composition as set forth in claim 1, wherein the excessive content of Bi is in a range of $0.4 \leq Bi < 0.5 \times m$ mol in terms of Bi.

3. A thin film capacitance element composition, wherein a bismuth layer compound having a c-axis oriented vertically with respect to a substrate surface is expressed by a composition formula of $SrBi_4Ti_4O_{15}$; and

Bi in said bismuth layer compound is excessively included with respect to said composition formula of $SrBi_4Ti_4O_{15}$, and the excessive content of Bi is in a range of $0 < Bi < 2.0$ mol in terms of Bi.

4. A thin film capacitance element composition, wherein a bismuth layer compound having a c-axis oriented vertically with respect to a substrate surface is expressed by a composition formula of $SrBi_4Ti_4O_{15}$; and

Bi in said bismuth layer compound is excessively included with respect to said composition formula of $SrBi_4Ti_4O_{15}$, and when the excessive content of Bi is expressed by a mole ratio (Bi/Ti) against Ti, Bi/Ti is in a range of $1 < Bi/Ti < 1.5$.

5. A thin film capacitance element composition, wherein a bismuth layer compound having a c-axis oriented vertically with respect to a substrate surface is expressed by a composition formula of $Sr_xCa_yBa_zBi_4Ti_4O_{15}$, $x+y+z=1$, $0 \leq x \leq 1$, $0 \leq y \leq 1$ and $0 \leq z \leq 1$; and

Bi in said bismuth layer compound is excessively included with respect to said composition formula of $Sr_xCa_yBa_zBi_4Ti_4O_{15}$, and when the excessive content of Bi is expressed by a mole ratio (Bi/Ti) against Ti, Bi/Ti is in a range of $1 < Bi/Ti < 1.5$.

6. The thin film capacitance element composition as set forth in any one of claims 1 to 5, furthermore including a rare earth element (at least one selected from Sc, Y, La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb and Lu).

7. The thin film capacitance element composition as set forth in any one of claims 1 to 6, wherein a c-axis orientation degree of said bismuth layer compound with respect to said substrate surface is 80% or more.

8. The thin film capacitance element composition as set forth in any one of claims 1 to 7, wherein leakage current density at electric field intensity of 50 kV/cm is 1×10^{-7} A/cm^2 or lower.

9. The thin film capacitance element composition as set forth in any one of claims 1 to 8, wherein an average change rate of a capacitance against a temperature in a range of -55 to +150°C is ±500 ppm/°C with the reference temperature of 25°C.

10. A thin film capacitance element, wherein a lower portion electrode, dielectric thin film and an

upper portion electrode are successively formed on a substrate, wherein

said dielectric film is composed of the thin film capacitance element composition as set forth in any one of claims 1 to 9.

11. The thin film capacitance element as set forth in claim 10, wherein a thickness of said dielectric thin film is 1 to 1000 nm.

12. A thin film multilayer capacitor, wherein a plurality of dielectric thin films and internal electrode thin films are alternately stacked on a substrate, wherein

said dielectric thin film is composed of the thin film capacitance element composition as set forth in any one of claims 1 to 9.

13. The thin film multilayer capacitor as set forth in claim 12, wherein a thickness of said dielectric thin film is 1 to 1000 nm.

14. A high permittivity insulation film including a bismuth layer compound having a c-axis oriented vertically with respect to a substrate surface, wherein

the bismuth layer compound is composed of the thin film capacitance element composition as set forth in any one of claims 1 to 9.

15. A production method of a thin film capacitance element as set forth in claims 10 or 11, comprising:

a coating step for coating a solution for forming said thin film capacitance element composition on a surface of said lower portion electrode, so that Bi in said bismuth layer compound becomes an excessive content, to form a coating film; and

a firing step for firing the coating film on said lower portion electrode to form a dielectric thin film

when forming said dielectric thin film on said lower portion electrode.

16. The production method of a thin film capacitance element as set forth in claim 15, wherein after forming said coating film on a surface of said lower portion electrode, said coating film is dried, then, preliminary firing is performed on said coating film at a temperature of not crystallizing the coating film and, then, said coating film is fired.

17. The production method of a thin film capacitance element as set forth in claim 15, wherein after drying said coating film, steps of forming still another coating film on the dried coating film and drying the coating film are repeated to obtain a coating film having a desired thickness and, then, the coating film is fired.

18. The production method of a thin film capacitance element as set forth in claim 15, wherein after drying and performing preliminary firing on said coating film, steps of forming still another coating film on the preliminarily fired coating film and drying and performing preliminary firing on the coating film are repeated to obtain a coating film having a desired thickness and, then, the coating film is fired.

19. The production method of a thin film capacitance element as set forth in claim 15, wherein steps of drying said coating film, performing preliminary firing and, then, firing are repeated to obtain a coating film having a desired thickness.

20. The production method of a thin film capacitance element as set forth in any one of claims 15

to 19, wherein a temperature of firing said coating film is 700 to 900°C, which is a temperature of crystallizing said coating film.

21. The production method of a thin film capacitance element as set forth in any one of claims 16 to 20, wherein a temperature of drying said coating film is from the room temperature to 400°C.

22. The production method of a thin film capacitance element as set forth in any one of claims 16, 18, 19 and 20, wherein a temperature of performing preliminary firing on said coating film is 200 to 700°C.

23. The production method of a thin film capacitance element as set forth in any one of claims 15 to 22, wherein coating, drying and/or preliminary firing are repeated, so that a film thickness of said coating film after firing becomes 200 nm or thinner.

24. The production method of a thin film capacitance element as set forth in any one of claims 15 to 23, wherein after forming said dielectric thin film, an upper portion electrode is formed on said dielectric thin film, and thermal processing is performed after that

in the air or in the oxygen atmosphere.